Space Weather Forecast

Issued on Sunday 13 October 2024 at 01:15 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance G1 Minor Storm day 3 (15 Oct) from glancing coronal mass ejection arrival. Isolated Moderate-class flares likely.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low activity with only common class flares observed. There are seven sunspot regions on the disc, with the largest of these in the northwest. This persists as a large main spot, but with some complexity from an emerging opposite magnetic polarity spot to its north. There are also two close proximity regions east of the south-centre disc. While relatively simple bipolar spots, the interaction between them brings the potential for solar flare activity. The other regions remain simple, with the only notable growth being the two new regions just west of the north-centre and in the northeast.

No Earth-directed coronal mass ejections (CMEs) have been observed.

Solar Wind / Geomagnetic Activity: A disturbed geomagnetic environment around Earth continued as solar winds eased since the 10 Oct CME arrival. Strong solar wind speeds, eased to elevated, from just below 700kms to around 570km/s. Interplanetary magnetic field was initially Moderate, but erratically eased to be Weak from 13/1200 UTC. The north-south component, Bz, was mainly positive (northward) with relatively brief spells of negative (southward) field. Geomagnetic activity was mainly Quiet to Active but with one period of G1 Minor Storm (Kp5) at 12/0900-1200 UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) continued easing after their recent enhancement, and were largely at background, with no Solar Radiation Storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity is expected with a likelihood of isolated Moderate-class flares and a slight chance of Strong-class flares.

Solar Wind / Geomagnetic Activity: There is a chance of a glancing impact from the CME early on day 3 (15 Oct). There are no other Earth-directed CMEs. Current disturbed geomagnetic environment around Earth is expected to continue easing with slightly elevated winds declining to background. There is a slight chance of a fast wind enhancement from a coronal hole day 3 (15 Oct), however this is low confidence. Mainly Quiet to Active geomagnetic activity at first is

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expected to become mainly Quiet with Unsettled intervals, but with a chance of enhancement from coronal hole or CME effects, mainly on day 3 (15 Oct).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to remain at background, with no Solar Radiation Storms occurring. However, there remains a slight chance of further enhancements given the large sunspot region in the northwest, and the sunspots now moving into the south-centre disc.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	5	1	30	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	No	70	70	60	60
Very Active	R3-R5 (X Class)	No	15	15	10	10

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	15	15	15	10
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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